

B) 1. (Amended) A multilayer printed wiring board manufacturing apparatus, to be used for processing a multilayer printed wiring board having an interlayer resin insulator, comprising:

Sub C1 a processing laser source, a scanning head for deflecting the laser beam in the X-Y directions, a camera for reading the positioning marks of a multilayer printed wiring board, an X-Y table for placing a multilayer printed wiring board, an input section for inputting the processing data of the multilayer printed wiring board, a memory section for storing the processing data or the arithmetic operations result and an arithmetic operating section, wherein

the processing data is input from the input section and this processing data is stored in the memory section;

a position of the positioning mark of the multilayer printed wiring board placed on the X-Y table is measured with the camera;

the input processing data is corrected on the basis of the measured position of the positioning mark to generate the X-Y table drive data in the arithmetic section and this drive data is then stored in the memory section; and

the drive data is read from the memory section and then the X-Y table and the scanning head are controlled in the control section and thereby the laser beam is radiated to the multilayer printed wiring board to eliminate the interlayer resin layer to form a hole for a via hole.

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4. (Amended) A multilayer-printed wiring board manufacturing method comprising the steps of forming the positioning mark and interlayer insulating agent layer a multilayer printed wiring board;

placing a multilayer printed wiring board having formed said positioning mark on the X-Y table of the multilayer printed wiring board manufacturing apparatus consisting of a processing laser source, a scanning head for deflecting the direction of laser beam in the X-Y directions, a camera for reading the positioning mark of the multilayer printed wiring board, an X-Y table for placing the multilayer printed wiring board, an input section for inputting the processing data of the multilayer printed wiring board, a memory section for storing the processing data or the arithmetic operations result and an arithmetic operating section, and inputting the process log data to this manufacturing apparatus:

measuring the position of the positioning mark of the multilayer printed wiring board with the camera, correcting the input processing data based on the measured positioning mark position to generate the scanning head and the X-Y table drive data in the arithmetic operating section and then storing this drive data in the memory section; and

reading the drive data from the memory section to control the X-Y table and the scanning head in the control section and radiating the laser beam to the multilayer printed wiring board to eliminate the interlayer resin layer to form a hole for a via hole.

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5. (Amended) A multilayer printed wiring board manufacturing apparatus comprising a CO₂ laser source, a scanning head for deflecting the direction of laser beam in the X-Y directions or an X-Y table for displacing the position of the multilayer printed wiring board, wherein the laser beam oscillated from said CO₂ laser source is converted to the beam of shortened wavelength by harmonic wave generating means and forms a via hole.

6. (Amended) A multilayer printed wiring board manufacturing apparatus comprising a processing laser source, harmonic wave generating means for converting the laser beam oscillated from said processing laser source to the shortened wavelength beam of second harmonic wave and a scanning head for deflecting the direction of the laser beam in the X-Y directions or an X-Y table for displacing position of the multilayer printed wiring board, wherein the wavelength of said processing laser source is between 720nm and the minimum wavelength of the laser source, or between 6000nm and the maximum wavelength of the laser source, and said processing laser source forms a via hole.

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11. (Amended) A laser processing apparatus comprising a CO₂ laser source, a scanning head for deflecting the direction of laser beam to the X-Y directions or an X-Y table for displacing the position of a work piece to be processed, wherein the laser beam oscillated from said CO₂ laser source is converted to the shortened wavelength beam by harmonic wave generating means and forms a via hole.

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12. (Amended) A laser processing apparatus comprising a processing laser source, harmonic wave generating means for converting the laser beam oscillated from said processing laser source to the shortened wavelength beam of the second harmonic wave, and a scanning head for deflecting the direction of the laser beam to the X-Y directions or an X-Y table for displacing the position of a work piece to be processed, wherein the wavelength of said processing laser source is between 720nm and the minimum wavelength of the laser source, or between 6000nm and the maximum wavelength of the laser source, and said processing laser source forms a via hole.
